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Perceived Financial Satisfaction, Health Related Quality of Life and depressive Symptoms in Early Pregnancy

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Abstract *Objectives* To assess the associations of perceived financial satisfaction and health-related quality of life (HRQoL) and depressive symptoms in an unselected pregnant population in early pregnancy. *Methods* 750 consecutive pregnant women attending the first communal ultrasound examination before gestational week 14 were invited to participate. Questionnaires assessing HRQoL (15D), depressive symptoms (Edinburgh Depression Scale, EPDS), medical, obstetric, and socioeconomic status were handed out. The participants were divided into three groups according to their satisfaction with their financial status, (unsatisfied, somewhat satisfied, and satisfied). Main outcome measures were 15D and EPDS-scores and dimensions of HRQoL. *Results* 325 (43,3%) questionnaires were returned. The mean 15D-score for HRQoL was 0,926 (SD 0,056). The financially unsatisfied women had

lower HRQoL than women in more satisfied groups (0.906, 0.923 and 0.931, $p=0.012$). The result remained significant, even after adjusting for age and education ($p=0.032$). The unsatisfied women had a higher mean body mass index (BMI) (25.4, 24.4 and 23.2 kg/m², p for linearity=0.002), were more often smokers, (13 vs. 4 and 3%, $p=0.029$), and had experienced at least one abortion (18, 14 and 7%, $p=0.017$). Dimensions of depression, distress and sleep explained the differences between the groups. 27% of unsatisfied women scored EPDS ≥ 10 points suggesting increased risk of depression. *Conclusions* Financial satisfaction in early pregnancy associates with HRQoL and risk of perinatal depressive symptoms. Unsatisfied women more often have risk factors for unfavourable pregnancy outcomes which may influence the later health and wellbeing of the mother and child.

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Keywords Pregnancy · HRQoL · Financial satisfaction · Depressive symptoms

Significance

This study concerns financial satisfaction and HRQoL during pregnancy. Women who are unsatisfied with their financial situation during early pregnancy have lower HRQoL and increased risk for perinatal depression. Inequality of HRQoL between socioeconomic groups in the early pregnancy exists.

Introduction

Pregnancy is a period with many physiological and psychological changes, which may influence the subjective

wellbeing of the mother (Otchet and Carey 1999; Schytt and Hildingsson 2011; Lacasse et al. 2008). According to population-based studies (Fiscella and Williams 2004), socioeconomic status is known to be associated with morbidity and mortality. Further, the differences in life expectancy between socioeconomic groups have increased during the last decades in developed countries (Bleich et al. 2012). Lower socioeconomic status is also a known risk factor for complications during pregnancy (deGraaf et al. 2013; Mortensen et al. 2011; Blumenshine et al. 2010). A low socioeconomic status is often associated with onset of depression, but also occupational status and household income have been suggested to be relevant for the development of depression (Kosidou et al. 2011).

The economic resources may affect health of individuals through material effects, conditions of living, as well as through social comparison and experiences of deprivation. Long-term accumulation of these resources can lead to socioeconomic inequalities of health (Aittomäki et al. 2010).

In a Scottish male population, lower social position, whether indexed by objective or subjective measures, was consistently associated with an adverse profile of established disease risk factors (Macleod et al. 2005). Also, life-course socioeconomic advantage is related to higher well-being when measured with general life satisfaction, especially among women (Niedwiedz et al. 2006). Financial satisfaction, compared to more common functions of socioeconomic status, represents the subjective perception of social position and has been associated with subjective well-being (Ng and Diener 2014).

The incidence of peripartum depression is estimated to be 7–15% globally (Stuart-Parrigon 2014; Kozinsky 2015). Depression, anxiety and mental stress of the pregnant woman have also been associated with a negative impact on pregnancy outcomes, i.e., the risk of preterm or operative delivery, and low birth weight of the child (Grigoriadis et al. 2013; Davalos et al. 2012; Dunkel Schetter and Tanner 2012; Räisänen et al. 2014). Depressed women may also have unspecific symptoms and they may suffer more often from fear of childbirth, possibly leading to decreased HRQoL, and additional visits to the antenatal clinic (Grigoriadis et al. 2013; Davalos et al. 2012; Dunkel Schetter and Tanner 2012; Räisänen et al. 2014; Nicholson et al. 2006; Setse et al. 2009).

Health-related quality of life (HRQoL) is a broad multidimensional concept based on a subjective perception of an individual's wellbeing, and includes the current health situation (The World Health Organization 1995).

The effect of pregnancy and delivery on HRQoL in an unselected pregnant population has not yet been studied extensively (Coyle 2009; Mogos et al. 2013).

This study presents the perceived financial satisfaction in relation to the HRQoL and depressive symptoms in early pregnancy in an unselected pregnant population.

Methods

Participants

In Finland, all pregnant women are offered an ultrasound examination during the first trimester [performed between gestational weeks (GW) 10 weeks 0 days –13 weeks 6 days] as a part of the communal pregnancy program. Between August 2011 and August 2012 altogether 750 consecutive women enrolling for the first ultrasound examination were invited to participate in this study, which was executed in the Helsinki University Hospital and in the South Karelia Central Hospital in Lappeenranta, Finland. The criteria for inclusion were (1) a vital pregnancy with GW < 14, and (2) the ability to read the Finnish or Swedish version of the questionnaires. Women were informed that their participation was voluntary and would not affect their future follow-up or medical care. The Ethical Committee of the Helsinki University Hospital approved this study (Ref 75/13/03/03/2011). Participants entered the study voluntarily and signed an informed consent form. Women attending the study were sent re-questionnaires concerning their HRQoL and depressive symptoms during the third trimester, 3 months postpartum, 6 months postpartum and 12 months postpartum. Data concerning the pregnancy and its outcomes was collected from the hospital records. Data was analyzed without disclosing the identity of the subjects.

Outcomes and Data Collection

15D

The primary outcome of the study was the overall HRQoL of the participants measured with the 15D-score. The 15D is a validated, generic, self-administered instrument which can be used both as a profile and as a single index utility score measure (Sintonen 2001). The 15D questionnaire includes 15 dimensions: *moving, seeing, hearing, breathing, sleeping, eating, speech, excretion, usual activities, mental function, discomfort and symptoms, depression, distress, vitality and sexual activity*. For each dimension, the respondent chooses a value between 1 and 5 to describe her current state of health (best level = 1; worst level = 5). These original values are then transformed into values from 0 to 1, based on the multi-attribute utility theory. The total 15D score represents the HRQoL of the subject with value

1 describing the best possible situation (no problems on any dimension) and 0 the worst (equivalent to being dead) (Sintonen 2001; Alanne et al. 2015).

EPDS

Depressive symptoms were assessed with the Edinburgh Postnatal Depression Scale (EPDS). It is a validated, 10-item self-report scale to screen for antenatal and postnatal depression in the community. Total points vary between 0 and 30 and cut-off points of 10–13 indicate a clinically meaningful risk of depression (Kozinsky 2015; Cox et al. 1987, Rubertsson et al. 2011). EPDS score was the secondary outcome of the study.

Subjective Perception of Financial Status

The financial satisfaction of the participants was determined by the question: ‘Do you consider that you have enough money for your needs?’ The response options were: (1) “more than enough” (2) “enough” (3) “almost enough” (4) “too little” and (5) “far too little” (Koskinen et al. 2012). Answers 1 and 2 were combined into ‘satisfied’, and answers 4 and 5 into ‘unsatisfied’ leaving three categories; satisfied, somewhat satisfied and unsatisfied. Household annual income was self-reported as were also marital status and family size. The OECD household net-adjusted disposable income is the amount of money that a household earns, or gains, each year after taxes and transfers and was calculated for each subject as suggested by OECD (OECD 1982).

Other Variables

The medical history of the participants was assessed with questions concerning chronic diseases, diagnosed mental disorders and current medication. If the subject had a significant medical condition requiring regular medication (i.e., hypothyreosis, hypertension, asthma, diabetes, inflammatory bowel disease, depression) it was included in the analysis as a chronic medical condition. Medical conditions not requiring regular medication were not considered as chronic diseases (i.e. migraine, allergies).

History of smoking (no/ quitte d /currently smoking; the number of cigarettes per day) and consumption of alcohol (portions per week before pregnancy and currently) were also collected. Height and weight before pregnancy were self-reported and body mass index (BMI) was calculated from these parameters.

Obstetric history comprised the number of prior pregnancies, deliveries, miscarriages and induced abortions.

Education was determined by the number of years of education and the current working status categorized as

currently working, studying, or temporarily at home with children/ unemployed.

Data concerning the current pregnancy and labor was collected from the hospital records and includes data concerning pregnancy complications (hypertensive complications, gestational diabetes, abruption placentae).

Statistics

The comparison between groups was made using t-test. Statistical significance for the hypotheses of linearity was evaluated by using generalized linear models with appropriate distribution and link function. In the case of violation of the assumptions (e.g. non-normality), a bootstrap-type test was used. The bootstrap method is of significant help when the theoretical distribution of the test statistic is unknown or in the case of violation of the assumptions. Correlation coefficients were calculated by the Spearman method; confidence intervals for the correlations were obtained by bias corrected and accelerated. The normality of the variables was tested by using the Shapiro–Wilk W test. Hommel’s adjustments were performed to correct significance levels for the multiple tests. Stata 14.0, StataCorp LP (College Station, TX, USA) statistical package was used for the analyses (Efron and Tibshirani 1993).

Results

Out of 750 approached subjects, 325 eligible women returned the questionnaires. 181 (55,7%) of the participants were satisfied, 105 (32,3%) somewhat satisfied and 39 (12,0%) unsatisfied with their current financial situation. (Table 1).

Demographic and clinical characteristics of the unsatisfied, somewhat satisfied and satisfied women are presented in Table 1.

The mean 15D score in the whole cohort was 0.926 (0.056). The mean total 15D score increased together with the subjective financial satisfaction [0.906 (0.065), 0.924 (0.060) and 0.931 (0.050)], p for linear trend=0.012 after age adjustment, the result remained significant after adjustment for education ($p=0.032$) (Fig. 1).

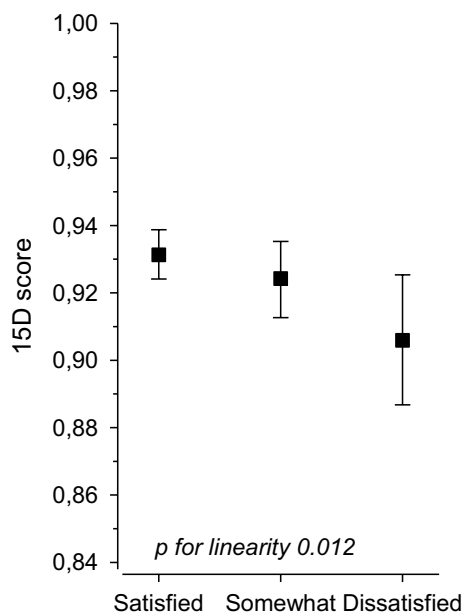
The differences in overall HRQoL (15D score) were largely explained by the HRQoL dimensions of distress, depression, and sleep (Fig. 2).

The percentage of women with an EPDS score ≥ 10 points in the whole cohort was 11%. The incidence was over four times higher in the unsatisfied group compared to the most satisfied group (6 vs. 27%, $p<0.001$, Table 1). The correlation between the 15D score and the

Table 1 Socio-demographic and socio-economic factors, health and health behaviour according to financial satisfaction

	Satisfied N=181	Somewhat satisfied N=105	Unsatisfied N=39	p value*
Age, mean (SD)	30.8 (4.1)	30.5 (4.6)	30.8 (6.3)	0.79
Education years, mean (SD)	15.2 (2.1)	14.0 (2.4)	13.4 (2.5)	<0.001
Living with a partner, n (%)	176 (97)	100 (95)	36 (92)	0.14
Children, n (%)	84 (46)	52 (50)	27 (69)	0.024
Labour-force status, n (%)				
Working or student	163 (90)	85 (81)	31 (79)	0.021
Unemployed	18 (10)	20 (19)	8 (21)	
Household income OECD 1000, median (IQR)	55 (37, 65)	37 (25, 45)	27 (16, 45)	<0.001
BMI, mean (SD)	23.2 (3.5)	24.4 (5.0)	25.4 (6.2)	0.0024
Chronic diseases, n (%)	15 (8)	13 (12)	4 (10)	0.43
Smoking, n (%)	6 (3)	4 (4)	5 (13)	0.029
Binge drinking once a month or more, n (%)	2 (2)	4 (4)	0 (0)	0.77
Mental disorder, self-reported, n (%)	14 (8)	11 (10)	7 (18)	0.063
EPDS, mean (SD)	3.5 (3.3)	5.3 (3.8)	6.9 (4.6)	<0.001
≥10, n (%)	11 (6)	14 (14)	10 (27)	
Abortion, ≥1, n (%)	13 (7)	15 (14)	7 (18)	0.017
Miscarriage, ≥1 n (%)	43 (24)	21 (20)	15 (38)	0.23

*p for linear trend

**Fig. 1** 15D score (mean with 95% CI) of pregnant women in first trimester according to financial satisfaction. P values for linearity, adjusted for age

EPDS score was -0.43 (95% CI -0.52 to -0.33). Three months postpartum the frequency of postpartum depression did not increase in a statistically significant manner in the unsatisfied group (data not shown).

Discussion

Main Findings

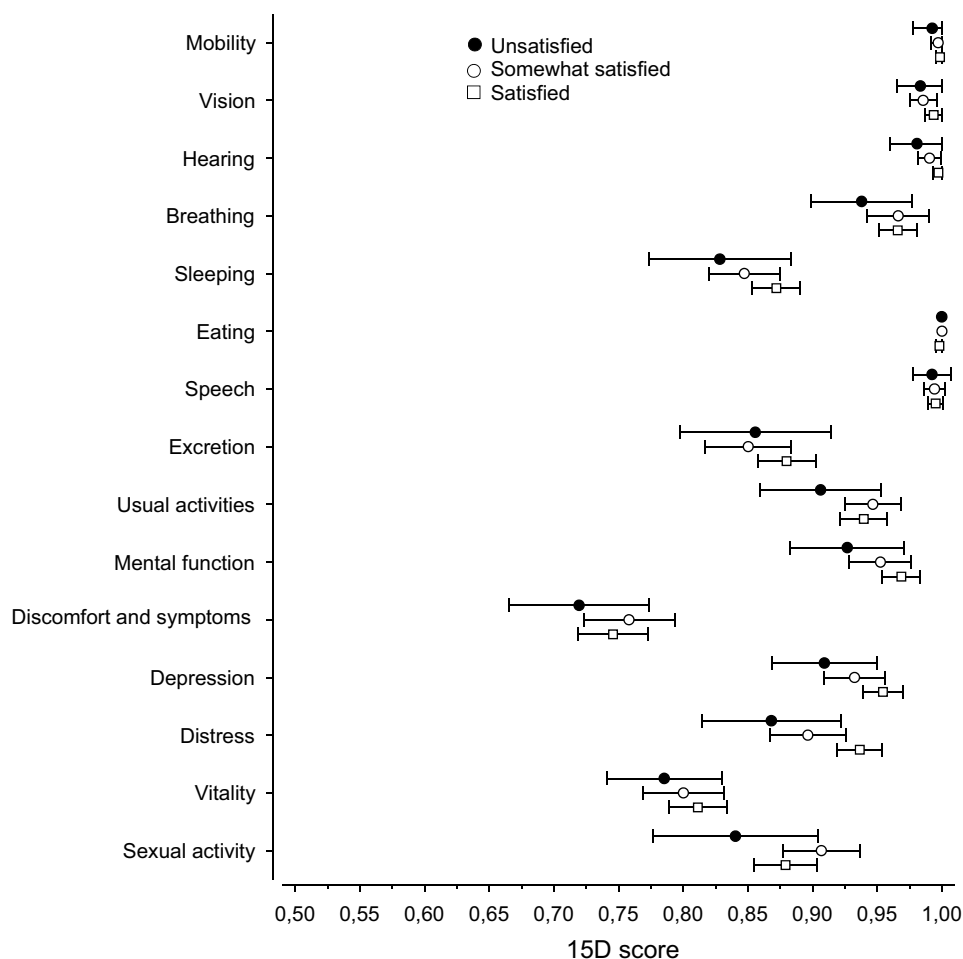
By asking the woman about her own opinion of her financial satisfaction, we were able to clearly identify different polarities of well-being. Financial satisfaction was associated with health-related quality of life and depressive symptoms in early pregnancy. The unsatisfied women also presented more often risk-factors for unfavourable pregnancy outcomes: they were more likely overweight, smokers, and their household income was indeed lower, when compared with the more satisfied groups. The incidence of chronic diseases between the groups was similar and did not explain the perceived differences in HRQoL.

The differences between the groups are mainly observed in the dimensions of distress, depression and sleep.

Strengths and Limitations

The HRQoL of pregnant women in the context of perceived financial subjective satisfaction has not been extensively studied. Financial satisfaction describes the disparity between the actual financial situation and desired situation thus providing the subjective aspect to the issue. It is though essential to acknowledge that women who experience psychological distress may also view their financial situation more critically than non-distressed women (Macleod et al. 2002).

Fig. 2 15D dimensions in different groups in first trimester according to financial satisfaction



The response-rate was low, as less than half of the questionnaires that were handed out were returned by mail. This is a well-recognized problem of postal surveys and is associated with a possible non-response bias (Jones et al. 1996, Asch and Jerdziewski 1997). Our cohort consists mostly of native Finnish women with a high socioeconomic status as 38.8% of participants had completed at least a Bachelor's degree level of education, compared to little over 32.6% in general Finnish female population (STAT 2013). Consequently, it is possible that the inequality of the HRQoL in a more heterogeneous, young female population may even be greater than described in this study although, after adjusting for education, financial satisfaction remained significant in relation to HRQoL.

HRQoL in the first trimester correlated negatively with family size. Thus it is possible that experiences from the prior pregnancies, financial burden associated with increasing family size or other family-related factors (Chang et al. 2014, Rouhe et al. 2009), which in our study were not collected, may contribute to the results of the study at least to some extent.

Interpretation

In the early pregnancy the proportion of women who were satisfied with their financial situation was 55.7% which is in concordance with prior studies; in a recent cohort study 54.9% of Finnish women aged 30 to 44 years considered their income to be sufficient (Koskinen et al. 2012). Our study revealed inequality of HRQoL, which was linked to distress and depressive symptoms in early pregnancy among those women who are unsatisfied with their financial satisfaction. However, after adjustment for multiple testing, only the difference in the dimension of distress remained statistically significant. A similar correlation was also detected in a prior study of a Finnish cohort of middle-aged and older adults (Rautio et al. 2013). It is worth noticing that compared to other European welfare states, in Scandinavia the inequality of well-being, associated with financial distress has been shown to be generally narrower (Niedwiedz et al. 2015).

The objective variables of socioeconomic status, the level of education and household income, correlated with women's perception of their financial situation.

This inequality of HRQoL among pregnant women could be associated with the fact, that some common risk factors seem to accumulate to a certain section of the population. This malaise of the mother during the pregnancy may also affect the next generation through different pathways (Grigoriadis et al. 2013; Davalos et al. 2012; Dunkel Schetter and Tanner 2012; Räisänen et al. 2014).

The incidence of an EPDS-score ≥ 10 in our cohort is in concordance with the rough incidence of perinatal depression reported in prior studies (Stuart-Parrigon 2014; Kozinsky 2015). In addition to a significantly higher incidence of EPDS ≥ 10 points, women in the unsatisfied group reported also more often mental disorders, even though this did not reach statistical significance. It is possible that depression and mental disorders are still underdiagnosed in this group.

It has been documented that depression is associated with lower HRQoL [Nicholson et al. 2006], and in line with previous studies (Nicholson et al. 2006; Setse et al. 2009; OrrS et al. 2007) we found that distress and depressive symptoms were strongly associated with impaired HRQoL also during early pregnancy. Interestingly, the incidence of pregnancy-related common complications (gestational diabetes and hypertensive disorders) was not higher in the unsatisfied group despite the higher incidence of common risk factors for these complications (Table 1). Also, the frequency of the peripartal depressive symptoms assessed with EPDS did not increase in the group of unsatisfied women. In Finland all pregnant women are provided free-of charge maternity health clinic services during their pregnancy including psychological counselling for those in need. This may impact the overall well-being of mothers during and after their pregnancies.

Conclusion

Women who are unsatisfied with their financial situation during early pregnancy have lower HRQoL and increased risk for perinatal depression and also other risk factors for unfavourable pregnancy outcomes. Inequality between socioeconomic groups still remains in our society.

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Compliance with Ethical Standards

Conflict of interest None of the authors have any conflicts of interest.

Ethical Approval The study received ethics approval from the Helsinki University Hospital (Women's, Children's and Psychiatric Ethics Committee), date of approval 03.03.2011 and the reference number 75/13/03/03/2011.

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